

ABSTRACT

An acoustic method for measuring of a distance between an emitter of acoustic energy and a target object provides for an accurate measurement by having the measurement's outcome invariant to the speed of sound variations along the acoustical path between the emitter and the target. A plurality of emitters and a plurality of receivers are used in the invention. One acoustic emitter and one receiver are located in a spatial region such that the sent and the reflected acoustical energy passes along substantially same vertical line between the emitter and the target. Another acoustic emitter sends the acoustical energy at an angled direction to the same area on the target's reflecting surface as the first emitter does. The corresponding echo travels to another receiver. During the measurement, two specific variables are being monitored. The first variable is associated with the distance between the first emitter and the target. The second variable is associated with the distance that the acoustic energy travels from the second emitter to the target to the second receiver. Both monitored variables are affected by the possible variations of the speed of sound. The sought distance between the first emitter and the target's reflecting area is calculated by a function of the ratio between the monitored variables, whereby, possible variations of the speed of sound to the result of the distance measurement are irrelevant.